

Typhus Fever.

An account of two epidemics
of Typhus Fever in Whitehaven, with
Statistics of some previous epidemics.

Typhus Fever although
now fortunately a much rarer
disease than at the beginning
and first half of the present cen-
tury, is not by any means un-
common in crowded and badly
built places. No doubt owing
to the improvements in sanitation
and the prevention of overcrowding,
the disease does not now assume
the terribly epidemic form it did
in earlier times; but there are
still accounts of outbreaks which
show that, given the suitable en-
vironment, the disease has not
lost much of its malignancy.

These outbreaks when they do

say 30 years
ago

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occur are at once checked by the removal of the cases from unfit and crowded places to Fever Hospitals, or other accommodation where they can be properly treated, and not be a source of danger to others; and severe sanitary measures are at once taken to prevent the spread of the disease, and generally succeed in doing so. But I am of opinion that many of the cases which the Local Government Board allow to be classified as Continued Fevers, are really cases of Typhus, although probably of a mild type. It is not always easy to trace the first case in an outbreak. The beginning frequently is in cases of so called "feverish cold," several of which probably occur without arousing suspicion, then a severe case attracts attention and the fever is discovered. In the 1884 outbreak which will be described, such was the case, and there have been lately admitted into the fever hospital here seven cases of Typhus Fever all traceable to one source. The first

case recognised was in a house, where two children had been laid up with what was considered to be a severe attack of influenza. In the same room where the children lay in, the mother was confined during their illness, and after recovering from her confinement, and being able to go about, took ill, with high temperature, & muttering delirium, death ensuing on the 12th day of illness - 28 days after her confinement. Two others of the children took Typhus Fever and were removed to the hospital. A married daughter who lived in quite a different part of the town, but who had attended, and been with her mother a good deal, took ill, as also her baby seven months old, and both were taken to the Fever Hospital. All these cases developed Typhus Fever, with copious rash, followed later by peeling of the skin, except in the case of the baby. Two other cases directly traceable to the above source of origin, occurred in a different part of the town. One of the family in which the disease

started was apprenticed to a tailor, who lived some distance away. Two of this tailor's children, aged 14 and 16 years were taken ill, and after four days, they showed signs of Typhus Fever, and were removed to hospital. It was only after enquiry, that it was found out that the apprentice came from the affected district. In this case the lad himself, who apparently had carried the contagion did not take the fever, thus showing that the infection may be carried without the individual who carries it, taking the disease.

Many of the cases of so called Typhoid Fever are, I believe, in reality Typhus, in fact, the case from which I imagine I contracted the disease was supposed to be Typhoid Fever, but I developed Typhus. While mentioning Typhoid, I must say, that I consider the name not a suitable one, it being applied to a condition of the patient in many diseases.

'Enteric Fever' much more correctly names the disease in which the most characteristic lesion is distinctly enteric. Many medical men are the

term Typhoid to describe a condition of fever in which, after excluding pneumonia and inflammatory ^{heat,} they cannot find any other cause for the rise of temperature, thus arriving at a diagnosis by exclusion.

The name Typhus is truly a panic-bearing sound, at least in this district, to the general public, who will listen calmly to accounts of Typhoid, but the very mention of Typhus or "the fever" immediately causes alarm.

From all accounts it seems as if fever in some shape or form was endemic in Whitehaven. Taking the records of the Whitehaven and West Cumberland Infirmary, which are fairly complete from the year 1783. I find there are few years in which the "fever" has not an important place in the reports. It is true that until 1848. no distinction was drawn between Typhoid and Typhus fevers, as up till shortly before that date both were considered the same or very similar, but from 1849 till 1880, at which latter date the fever wards in the Infirmary were closed, the numbers are fairly complete. Variations in the malignancy

of the disease occur in different years, but whether these be due to meteorological causes or not, I cannot say, although the medical men of the time seemed inclined to attribute the changes in severity and type to such causes.

The town of Whitehaven, with a population of about 14,000, is situated very little above sea level, on the shore in Cumberland. It is almost surrounded by elevated land, and lies in a basin open only towards the south into the St Bees valley, and north-west towards the sea. The ground on which it is built is purely sandy, there apparently having been an arm of the sea running through the St Bees valley and cutting off the high land of St Bees Head from the mainland.

The town is sewered, the sewage being pumped into the sea at low water, and there is a good water supply from Emeraldale Lake, very similar in quality to that of Loch Katrine which supplies Glasgow.

The dwelling houses in some parts are filthy and badly built, situated up crowded back courts and close alleys.

where Sunlight and good ventilation are almost unknown. The staple industries being the coal and iron trade, the labouring class is composed of colliers, blastfurnacemen, and iron ore miners, and a few dock or quay labourers, occupations which do not tend to cleanliness or sobriety.

After the outbreak of fever in 1884, the Local Government Board inspector in his report recommended the closing of a whole tenement of houses, as unfit for human habitation; and gradually the most objectionable Court, and back premises are being improved, or where possible closed altogether.

In this paper I propose to give ^{an account} of two outbreaks of Typhus Fever, in 1883-84 and in 1890. I have also drawn up tables of the statistics of fever cases which occurred in some previous epidemics.

Of the two last outbreaks, (1884 & 1890) I have had considerable and intimate acquaintance, as in the first (1884) I was medical attendant at the fever hospital, until I myself took the disease, and in

1890, I alternately with the Medical Officer of Health for the town (D. Fisher) saw the cases in the fever hospital and temporary hospital twice daily during the whole epidemic. The Statistics which I deal with in the latter part of the paper are derived from the books of the Infirmary dating from 1783 till 1818, and 1830 till 1880, unfortunately the books for the 1819 till 1829 inclusive, are ^{un}missing, otherwise the reports are pretty full.

Beginning with the outbreak of 1883-84, the first of which I have any personal experience, I find that the starting of the disease, as in most cases was obscure. The first case admitted into the fever hospital was brought from a court, in a dirty, confined, closely populated district, where in a house of two small apartments, five people lived, consisting of a mother, son, and three daughters. The patient was the eldest daughter and had been ailing for more than a week before admission into the hospital. During her stay there, neither the Typhus rash nor other symptoms were well

marked, and. Her temperature never rose above 103°. The skin had a dirty, marly look for some time, but it seemed more due to want of cleanliness than any other cause, occasionally she became fretful and wandering.

She was Seventeen years of age, had always been healthy, but had never menstruated. About a week after admission when her temperature was normal and convalescence established, she showed signs of mental derangement, passing all her motions in bed, and requiring watching to prevent her covering her hands with feces, and throwing it over the walls of the room as she did on one occasion. She remained in this condition for about a week, but ultimately recovered perfectly, although before leaving the hospital she had not menstruated. The next case was a brother of the previous one, aged 20 years. He was admitted on 12th Aug: 1883, having been ill for two days.

On admission his pulse was 100, his temperature 104°, tongue dry reddish brown with transverse cracks. Shortly after

admission he had a copious loose motion, probably due to medicine which he had taken. The third day after admission, that is on the 5th day of his illness, the eruption appeared, and became very distinct with purpurous spots. At night he seemed to get no sleep, muttering incessantly. On the 9th day after admission his lungs became congested, poultices and elevation seemed to give partial relief, but his temperature never fell. On the 10th day in the hospital, 12th of his illness, his pulse was extremely weak and inconstant, with respiration short and gaspy. He died on the morning of the 13th day of his illness. Subjoined are his temperatures, pulse and respirations:-

Aug 13	102.2° mom.	104° even	88 pulse	27 Respir.
" 16	103.4°	104°	101	32
" 17	105°	105°	94	35
" 18	104.6°	105°	100	31
" 19	103.2°	104.2°	100	32
" 20	105°	104.6°	120	33
" 21	105.6°	106°	130	36
" 22	106°	104°	?	?
" 23	Died at 4 AM.			

It is noticeable that the temperatures

were high all through, never getting below 103° unless on the morning after admission. Besides these two, there were other three cases, admitted during the month, two females and one male, two being children under 10 years of age both of whom had comparatively slight attacks. The other adult, a female aged 26 years, ran an easy course, her temperature never rising much above 103° . Eight days after her admission, during the night, she became faint and collapsed, but after a time recovered, two days afterwards she passed a black tarry like motion. She mentioned to the nurse that the day before she had fainted, there was a severe pain in her belly, this however she had not complained of at the time.

From August 1883 until the beginning of March 1884, there were no new cases admitted into the fever hospital. Towards the end of February several suspicious cases occurred, and on the 8th of March, a woman aged 32 years, was admitted with the symptoms of Typhus Fever.

The history of her case was, that she had been looking after a case of "feverish cold," and feeling ill had gone to bed two days before being brought into the hospital. On admission she complained of severe headache, and pain in the back. Her eyes were suffused and heavy, and her skin had a slightly mottled appearance, with a temperature of 102.8° ; tongue was thickly coated and tremulous. There wasordes on teeth and gums; her breathing was irregular, and there was an occasional dry cough; at the bases of both lungs slight moist râles were heard, respirations 28. There had been no sickness and her bowels had not been moved for over 24 hours.

The mottling in the skin became more marked, and developed into distinct Typhus rash; She afterwards made a good recovery. This was the first of a series of 45 cases, most of which were treated at the fever hospital. In nearly all the cases seen by me, the eruption was distinct, in three cases petechial, the eyes heavy and suffused, the hearing

dulled, and in the majority of the cases a musty sickening smell was very marked, especially if bending over or close to the patient. In one case that of a little girl 9 years old, there was internal Strabismus during part of the time she was delirious. The rash in this case was petechial, but although she suffered a severe attack of the fever she made a good recovery. In another case, also a little girl, the pupils were widely dilated, and the patient did ^{not} seem to be able to see distinctly even when otherwise sensible. This condition improved as she recovered her strength and on leaving the hospital her sight was perfect.

After attending the fever hospital for nearly a month I contracted the disease. I attribute ^{my} getting the infection from a case which I was seeing outside the hospital, for while auscultating a woman who lived in a most wretched part of the town, nicknamed Mount Pleasant, I got a whiff of a nasty smell, which made me feel sick, and after getting outside of the

home. I vomited, and did not afterwards feel altogether right for four days. — when I was completely laid up.

Three days after I had the sickness, languor and weariness were most marked, so much so, that I could not go to the hospital, which is situated on the top of a hill, to which a pretty steep road leads, without resting by the way.

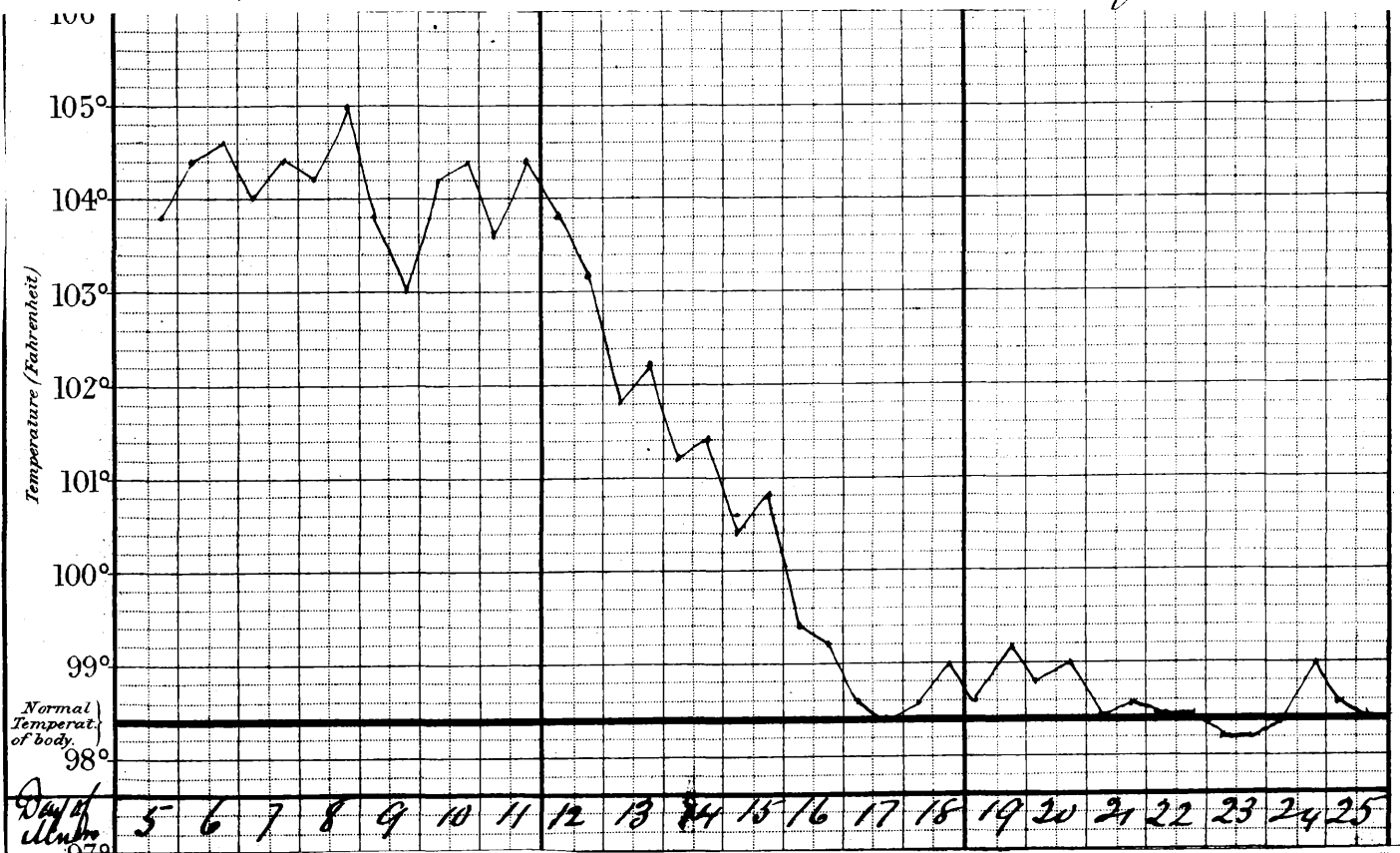
That same night while out visiting I took a shivering and with difficulty regained heat. I had been cold all day, but had not till then actually shivered. The gas light seemed to be of a peculiar yellow tinge, and I heard a noise in my ears like the escape of steam. I made the remark to a friend who was in the house at the time, that some of the pits were blowing off steam, but he said there was no such noise, at least he could not hear it. I had a slight headache, but not severe, it seemed more heavy and giddy than actually painful. During that night I could not sleep, but had no great discomfort except restlessness. On the 4th April I took my temperature and

found it 102.4° and did not get out of bed. It was on the 31st March I had first been Sick, and on the 2nd April I took the Shivering. I sent for a medical friend to call and see me, which he did and gave me some Saline mixture as I was rather thirsty. On trying to read I found I could not follow the thread of the story, so gave it up. The day following my temperature was 103.2 but so long as I lay quiet, felt no discomfort; all I desired was to be left alone, and only on moving my head or in trying to raise it, did it feel pained or giddy. On the 6th April I was seen by three medical friends, who recommended my removal to the infirmary, which indeed I myself desired. I was taken to the infirmary on the ^{after} in the ambulance, the only objection I had, was to the trouble of moving. While being carried into the ambulance, what most excited me was the crowd of people who had collected round the van, as invariably happens when such a vehicle stops at any house. I felt intensely irritable, and I dare say

showed it to Dr. McLoughlin, who kindly accompanied me to the Infirmary.

From the time of my admission into the infirmary, till fully a week after, what happened I do not know, except by information afterwards received, as almost immediately after going into the infirmary I became delirious and wandering. On the 13th day of my illness it began to dawn on me, that I had been ill, and that the miseries I had suffered and the pleasures experienced were unreal and only the creatures of a diseased brain. A slight pneumonic affection threatened from the 18th till the 20th day of the illness, which raised the temperature slightly. This however passed off without becoming serious. During convalescence my skin peeled off, especially where I had the poultices applied to my chest for the threatened lung mischief. I was also much troubled with constipation after recovery, and the act of defecation was excruciatingly painful; as strength returned however this diminished, and I left the infirmary after six weeks residence there. The following were the

temperatures, while in the infirmary.



From the temperature chart it will be seen that on the 8th day of illness the greatest temperature was reached, and from the 11th day till the 17th the temperatures continued falling, with a slight rise towards night.

The sensations experienced during the period of delirium were not of a particularly painful character. Some of them, in fact, were almost pleasant. At one time I was in a sandy desert near the Suez Canal along with a lascar boy, it was fearfully hot and I felt parched

with thirst, while the boy seemed dying. The boy who was with me, had been an attendant on me three years before, while on a voyage between India and Britain, and from that time until I met him in my dreams all recollection of him had completely slipped from my memory, but I immediately recognized him and recollected his name, although I question if I could have named him before taking ill. Another illusion was wandering through a wood with intensely green foliage. In this wood I met with Dr. J. Anson, whom I begged to give me an opium pill to send me to sleep as I felt tired. I have no doubt that I really saw Dr. J. Anson at the time, as he frequently was in seeing me, though not in regular attendance. At another time I seemed to be sailing in an open boat, under a burning sun with green sea all around, and coming to a green palisading, tried in vain to look over it, as I felt sure land was on the other side where I could get fresh water and rest. Dr. Fisher who attended me during the attack told me afterwards that during

a period of quiet, after waking from a short sleep. I said to him, "Is Min dead"? He answered, "No, he's doing well." I then said, "He's pretty bad isn't he? I thought he was dead." This was said in such a sensible and coherent manner, as to appear as if I had been quite conscious, had it not been for the absurdity of asking after my own death. The impressions left by the illusions were very vivid and so apparently real, that several times when convalescent, but weak. I could hardly believe they had not happened. One time especially where I supposed myself with some friends in a boat off the Island of Arran, I actually remembered what we were talking of, although as a matter of fact, I had not been to Arran for five or six years previously. During the period I was in this condition, the only really disagreeable sensation was one of thirst and heat, and the unsatisfactory feeling of wanting rest but not being able to get it. One peculiarity I particularly noticed, was the predominance of green colouring. This colour being marked in

I had an experience something like this but
more elaborate.

I not only witnessed my own death, but my own
p. m. examⁿ. and was well on the way
to my own ultimate disposal at the
general resurrection, when the crisis came.

W. B. Anderson

not good
English

nearly all the illusions, except when I was in a desert. I already stated that I blamed my illness on an outside cause; but it may have been that, not being quite well before, the sickness which I felt afterwards ^{the} was due to impaired digestion during the incubation period of the disease.

I have purposely described at considerable length my own impressions and feelings while suffering from the fever, as I think personal experience is of much more value than hearsay evidence of others.

On resuming work, about the end of June, no new cases were admitted to the fever hospital during that outbreak. The total number of cases as already stated was 45. Consisting of 24 males and 21 females.

Of this number 5 died, 4 males, and 1 female, giving a total death rate of 11.11 per cent. and of 16.66 percent males with only 4.76 per cent females. The cause of death in nearly all the cases was asthenia occurring from the 10th till the 14th day of the illness.

One of the males died rather suddenly.

from failure of heart action, he had been a heavy drinker. The female was intensely wakeful all through her illness and died on the 12th day.

Of course the number of cases in this outbreak is too small to draw any deductions from, but I shall go fuller into the subject while dealing with the statistics of fever in this town in previous and succeeding years.

From the summer of 1884 till 1890, no cases of Typhus Fever were treated at the hospital.

In the Autumn of 1890, following the severe epidemic of Influenza, Typhus Fever again broke out in this town. The origin of the outbreak is obscure although the dissemination of the disease is easily traceable from a certain point. A case of pneumonia in a man aged 40, was attended by me, and after a weeks illness, he died on the 9th Sept: 1890. Three days before his death it was noticed that where he had been poulticed there appeared gangrenous patches, and although the lungs seemed to improve, the man's

general condition became much worse; his tongue dark brown, with a dry baked appearance, and delirium with a low typhoid state. Being suspicious, I mentioned the case to the Medical Officer of Health for the town, who saw it along with me, and who agreed with me, that the symptoms were probably due to the man's condition and habit of body, as he was a notorious drunkard and evil liver.

Unfortunately after his death there was a wake held to which all the friends were asked, and many of those who attended that wake afterwards developed Typhus Fever of a malignant type. The house or room in which this case occurred was up a passage about four feet wide, and 40 feet long, off one of the lowest and dirtiest streets in the town. There were four houses on one side of the passage, and opposite was a wall 10 feet high, on the other side of which was a similar passage with the houses in it also facing the blank wall. In the house, which was in a filthy condition there lived

besides the patient, his wife and four children. At the top of the passage next door to this house, was an unflagged cellar into which I believe slops and rubbish of all kinds were thrown, while over this cellar was a room reached by a very dilapidated stair, and in which there resided four women. From enquiries made afterwards, it transpired that about a week before the man's illness, one of the women aged 14 years, a prostitute, had been ill with "inflammation of the lungs." and some charitable lady wishing to separate her from her evil surroundings, had had her removed to a better lodging in another part of the town, where she recovered. The woman with whom she was sent to lodge shortly afterwards developed Typhus Fever and was removed to hospital. From the passage where the man died the fever spread. Another young woman who resided along with the first mentioned took Typhus shortly afterwards and was sent to hospital, and, while the man's wife escaped two of his children took it, and one

of them died. The wife said she had already had the fever six years before. How the disease originated it is difficult to say, and the question whether the man or the girl was the first case was debated. It was suggested that the man had brought the poison from Newcastle-on-Tyne, from which place he had returned six weeks before. I refused to accept that explanation and am of opinion, that the girl who had been removed from the count, was the first case. Although as in the case of the man, if he had Typhus, the disease was not recognised as such. If the girl had Typhus, how she came to get it is questionable, but as these women are in the habit of going on board of the small sailing vessels, that trade between this port and Ireland or the Isle of Man, and keeping company with the sailors, it is quite possible, she may have got the contagion in that manner. I have seen cases where the poison has been distinctly carried either by individuals or their clothes, when they

themselves did not take the disease.

There is the question of the origination "de novo," and certainly the surroundings were in every way suitable for such happening. Here we have people of filthy habits, and bad living, with filthy surroundings in a dirty narrow passage into which the sunlight hardly ever enters. In fact everything to be desired for the propagation or perhaps the origination of this deadly fever.

In whatever way the disease originated there is no question as to its spread, for very shortly after the wake several cases occurred among those who had been present. A sister and brother-in-law, who resided at a mining village about six miles out of Whitehaven, and who had come in to the wake, took the disease about a week after, but luckily it did not spread there. Another sister and brother-in-law took the disease to another part of the town; and several of the neighbours who had been in and about the house took it. But this was not the only focus, for the

Young woman, who apparently first had it, after getting well, left the home she had been removed to, and went to other lodgings, where after a short ^{time}, fever broke out, and a man and woman were removed to hospital.

The total number of cases in this outbreak was 63 of whom 11 died. In the earlier cases the disease seemed to be intensely severe and most of the deaths occurred among those who were early attacked. In nearly all the cases, the typhous eruption was well marked and the cerebral symptoms severe, with extreme prostration and debility in the second week. The only cases in which the rash was not distinctly seen were in children. Two children took ill, with feverishness and slight wandering at night. In neither case was there any eruption, although the skin seemed slightly reddened, but more like the early Scarlet Fever rash, there was no suffusion of the eyes, only a heavy and stupid look. Both made good recoveries. After they

became convalescent, their mother took Typhus Fever, with well marked mulberry rash and dusky appearance of the skin. She was removed to hospital and also made a good recovery. Shortly after the commencement of the epidemic the hospital became full, and another temporary one was formed in an unused pottery. Two flats of which were used, one as a male, the other as a female ward, while a large outbuilding was used as a convalescent ward. There made an excellent temporary hospital and many of the cases were treated there.

In the third week of the outbreak D. J. R. I. aged 35 years, was attacked with the fever. During the first week of his illness he was attended by D. K. occasionally, being seen by other medical men in town. The eruption appeared distinctly on the 5th day of his illness, and increased until the whole skin was of a dusky colour, with petechial spots over his abdomen, chest, arms, and legs. D. K. after attending him for a week, also took the disease, and I was asked to take charge of D. J.

I found him moribund, delirious, restless and wanting to get out of bed, temperature 103.2° , pulse weak and irregular with slight crepitation at bases of both lungs. There was a mitral murmur which rendered the heart sounds very indistinct. Next day, the 9th of his illness his condition was worse; he lay sunk in bed, muttering, and occasionally trying to get up out of bed. A trained fever nurse was got to look after him, as during one of the nights he had got out of bed and gone into another room. On the 9th night, his temperature rose to 105.2° with sleeplessness and delirium. This sleeplessness continued all the next day and night in spite of Bromide of Potassium, combined with Carbonate of Ammonia being given pretty freely. The day following, the 11th of his illness, he seemed rather quieter and better with inclination to sleep. At 10 P.M. ^{when} Dr. J. Anson and I left him, he was quiet, temperature 104.2° pulse very weak but more regular, and both Dr. J. A. and myself considered his condition improved; at 3.30 A.M. I was called to him and found

him dead. The nurse stated that about midnight he got rather restless but settled again after having some Brandy and milk, and until shortly before death, seemed perfectly easy; at about 3 a.m. he again had some brandy and milk, and shortly after on trying to raise himself he fell back with a gasp and died immediately. In this case the debilitating effect of the fever poison on an already diseased heart, was apparently the cause of death. From the beginning of his illness, he was afraid that his heart would not stand it, and his prognosis came too true. In this case the temperatures continued high with no remission and reached the highest point on 9th day of the illness, being then 105.2° . The fall to 104.2° the night before death, seemed to show improvement only the heart could not stand the strain.

In the case of J. J. K. aged 24 years; after feeling tired and languid for two or three days, he had a severe headache, and felt shivery and cold.

On the 4th October went to bed with a temperature of 100.8° , tongue coated with

white thick furring, eyes heavy and suffused,
 temperature same night 103.4° . The
 fever ran the usual course with mut-
 tering delirium and occasional wilder
 outbreaks. On the fourth day of the
 illness his temperature reached 104.8°
 which was its highest point. During
 the 9th and 10th day of the disease there
 was almost complete suppression of
 urine and temperature went up to
 104.4° . Late on the 10th day some
 very thick urine, almost like mucus
 came away, and after that the
 action of the kidneys improved and
 the temperature came gradually down
 till the 15th day, when it was sub-
 normal. I affix copy of temperature chart.

James Tyson Kitchin Oct 24.



On comparing D. K.'s temperature chart with my own it will be seen that his highest temperature was on the 5th and mine on the 8th day of the illness. There seems a remission of the fever in his case on the 10th, in mine on the 11th day. The fall in his case was much more rapid coming from 104.4° on the 10th to 98.2° on 15th day. While in my case it fell from 104.4° on the 11th to normal on the 17th day.

In both cases the result was similar namely rapid and complete recovery.

During his illness D. K. informs me that his impressions were not wholly pleasant. At first he took an intense antipathy to a nurse who had been got to attend him, and she had to make way for another. He had no reason for objecting and could not explain his action more than that it was because she was a stranger.

In the delirious stage of his illness, he saw a Frenchman attempt to kill his wife and was highly satisfied with his ruse of putting up a dummy figure in place of the wife to be shot at, and thus foiling the murderous foreigner.

Another illusion was, that a new

method of treating fever cases was discovered, which consisted in elevating such cases on the top of a long pole, in a kind of hammock and letting them dangle there in the wind, and he was being treated in this fashion. As in my own case his impressions of what happened, or rather what he imagined to have happened, were intensely vivid and real.

Of the other cases in this epidemic nearly all were of a severe type.

All the nurses and assistants at the temporary fever hospital, who had not previously had the disease, took it. The chief nurse, a trained fever nurse from Liverpool, took it. He was a man of 48 years of age, and although he had great experience of fever cases had never taken any fever. He boasted that he never had, nor would take any fever, but he was mistaken, and after superintending the hospital arrangements and nursing for about three weeks, he was prostrated himself. He distinctly blames as the cause of his illness,

assisting to remove the body of a woman aged 65, who had died of the disease. His temperature never rose above 103.6° and he made a good recovery. In one of the cases, a female servant at the hospital, there was the complication of a cut throat. Her husband had come demanding money from her, and on her refusing his demands, attempted to cut her throat. While in bed with the wound in the neck, symptoms of fever developed, and although the wound did not heal during the acute stages of the fever, on convalescence it healed rapidly leaving only a very slight scar.

Nearly all the cases that recovered did so rapidly and with slight if any complications. In one man aged 50, there was extensive bedsores with sloughing of the back; this delayed his recovery, but in the course of a few weeks the sores healed completely. In some cases there was mental weakness for a day or two after convalescence, but as strength returned this passed off.

Of the deaths, most occurred towards the end of the second week of the illness. In one case in the earlier part of the outbreak, a man aged 40. had the fever, which ran its usual course, with well marked eruption and petechiae. On the 12th day of his illness his temperature fell, and on the 14th was 100.4 . During the four following days - that is till the 18th - it fluctuated between 100° and 100.8° but never getting to normal. There was no lung or other organic mischief to be discovered, his tongue cleaned, and his skin became cleared, but always with traces of the rash. On the 19th day his temperature fell to 98° and 97.4 and remained so till his death on the 21st day. The cause of death seemed to be simply exhaustion, probably due to the fact that previous to his own illness, he had nursed his wife through the disease.

In another case the patient died four days after admission, seventh day of the disease. He was a young man 30 years old, and seemed to sink beneath the poison rapidly, the rash in this case was almost livid.

One woman died from weakness following severe epistaxis. She was 46 years of age, and apparently went on well till the 10th day of her illness, when bleeding started from the nose. Perchloride of Iron checked this for a time, but it recurred, and plugging the nostrils had to be resorted to, but she did not rally afterwards and died on the 12th day. The

cause of death in all the other cases was exhaustion from restless insomnia and cardiac failure. In one woman, aged 65, death occurred suddenly. She was very stout, and heart sounds were never very distinct. The heart's action ceased in an instant, although pulse had been regular and steady but very weak for two or three days before.

As previously stated there were 63 cases of fever in this outbreak, 24 were males, and 36 females, with a total of 11 deaths five males and six females. This gives a general death rate of 17.46 per hundred, or 18.51 per cent. males and 16.66 per cent females.

The mortality in this outbreak, was considerably greater than in that of

1884. in which year the general death-rate was only 11.11 per hundred.

“Taking both epidemics together, there was a total of 108 cases with 16 deaths which gives a death-rate of 14.81 per cent. Fifty one cases occurred in males, with 9 deaths equal to a death rate of 17.64 per cent. 57 were females with 7 deaths or 12.28 per cent.

On analyzing the ages of the cases, as will be seen in the table following, there were 19 cases under ^{10 years} with no deaths; 37 between 10 & 20, with 3 deaths; 22 between 20 and 30, with four deaths; 19 between 30 and 40, with four deaths; and two between 50 and 60 with one death:—

Ages.	Males	Females	Total	Deaths		
				Males	Females	Total
Under 10	10	9	19	—	—	—
10 to 20	16	21	37	1	2	3
20 to 30	14	8	22	3	1	4
30 to 40	5	14	19	4	—	4
40 to 50	5	4	9	1	3	4
50 to 60	1	1	2	—	1	1
Totals	51	57	108	9	7	16.

The information to be derived from such a limited number of cases is

not of great importance from a statistical point of view, so I intend to classify and compare them with the other cases collected.

From a clinical point of view, the instruction is considerable. The outbreak of Typhus succeeded a severe epidemic of Influenza, and both diseases are similar in their onset. In both is there the severe headache, high temperature, pains in limbs and back, and cerebral disturbance. But while in the case of influenza these symptoms pass off in the course of a day or two, in Typhus they become aggravated.

In several cases of pneumonia supervening on an attack of influenza, the typhoid symptoms were very marked, and the debility during convalescence closely resembled that of Typhus fever.

One remarkable point was, that at the commencement of the epidemic, the disease seemed much more virulent than later on. The poison seemed to expend itself on the earlier cases.

This I had noticed in 1884, as well as 1890, and mentioned the circumstance.

to Dr. Spiers, the Local Government Board inspector, when he was last down here in 1891. His experience was quite in accord with mine, and he was of opinion that such was very frequently the case. The most rapidly fatal cases occurred in the earlier part of the outbreak, and later on the disease assumed a rather milder form. Besides being apparently more severe in the early part of the outbreak it was more infectious, and very few who had any contact with those suffering the fever, except those who previously had it, escaped; as was shown in the cases of D^r. J. and K., and all the attendants at the fever hospital.

During the first week, the risk of infection was not nearly so great as later on, and in the convalescent stage the infective power was not diminished. It was noticeable that in nearly all cases where there had been a copious eruption, that desquamation took place, and that after that the skin and complexion looked very much clearer and healthier. This was remarked by the patients themselves,

and in most cases better general health was enjoyed after the attack, than before.

In one case, a man with a nasty chronic ulcer on his leg, the sore, in the acute stages of the fever, looked sloughy and unhealthy, but after convalescence healed rapidly, thus showing an improved condition of his general bodily health.

So far I have purposely refrained from mentioning anything about the treatment. The most important part, by far, of the treatment was the nursing, with proper attention to feeding. Milk with Soda water in the early stages was the main food, this was varied with quantities of beef tea, meat juice or extract, and light soups. In some cases egg flip was given. All these things when given were in small quantities and frequently administered. When convalescence was established fish and eggs with a little soup, were generally given for a day or two, then a little mutton, followed shortly by ordinary diet with oatmeal porridge and milk. The appetite after recovery

was good, in some cases, almost ra-
pid, and invariably a day or two
after ^{the} temperature had come down
to normal, the cry was for food.

In the way of drugs, Some Saline
tincture, consisting of Liqueur Ammoniac
Acetatis. or Nitrate of Potash, was
generally prescribed early on, and
occasionally combined with those, small
doses of Sulphate of Magnesia. In
Some cases Dilute Sulphuric Acid,
with Tincture of Hyoscyamus, or small
doses of Tincture of Opium, was given
for Thirst and Sleeplessness. Bromide
of Potassium was useful in Some
Cases of wakeful delirium, generally
it was combined with Carbonate of
Ammonia, and occasionally with
Tincture of Digitalis as a cardiac
tonic. In nearly all ^{adult} cases
Alcohol in the form of Brandy was
given after the first week, and in Some
cases where the pulse was tremulous
and Shaky, ether and Digitalis were
given. The alcohol was generally
given in milk.
Complications were treated as
they occurred. Poulticing the chest.

for pneumonic trouble, afterwards rubbing with Camphorated oil and covering with flannels or cotton wool, generally checked the tendency to lung mischief. Diluents in the form of barley water or lemon water, with a little cream of tartar were freely given, when the kidneys did not seem inclined to act freely. When constipation was troublesome castor oil was given. After the first week sponging the back and hips with Methylated Spirits of Wine and water, was done, in nearly all cases three times daily, to prevent bedsores, and in most cases this succeeded in preventing the skin from breaking.

In examining the reports of the Whitehaven and West Cumberland Infirmary, I find that fever has hardly ever been out of Whitehaven, for any considerable time since 1783. Unfortunately until 1848 there was no distinction drawn between Typhus and Enteric fevers, and at an earlier date the general term "fever" covered a considerable number of ailments, inflammatory and otherwise. In the early report the terms Nervous, Putrid, and Malignant are applied to a fever apparently very like Typhus, but as the number of cases reported may include other fevers, I have not used them for statistical purposes.

From 1830 to 1848, I have in great measure taken D. J. Anson's figures as published in the Lancet for September 1848. From 1849, I have carefully gone over all the books until 1880, and classified according to age, sex, and result, all the cases of Typhus I can therein notify. To the above two sources of information I have added the results of

the two last outbreaks, 1884-1890.

All the cases together make a total of 2162.

In looking over the older reports it is interesting to notice the character of the disease in different years, and although the numbers cannot be used for the purposes of comparison, still it shows that "fever" whether Typhus or not, has always been common in Whitehaven.

In 1783, the year in which the Infirmary or Dispensary as it was then called, was opened, there is mention made of "a nervous fever, distinguished by powerful characteristics." There were 26 cases, with no deaths, and plenty of pure air and cleanliness were enjoined as an important part of the treatment. The following year, the disease is described as "a nervous fever of a malignant nature, the distinguishing characteristics of which were, always preceded by those of universal debility, lassitude and languor with the symptoms of cold; hot and sweating fits were intermittently blended, and increases most eminently dangerous various affections

"of the brain, and powerful determinations
"of the bowels occurred." Of this fever
there were 371 cases with only 10 deaths
In 1785 "the fever changed its type," in
"the end of June and July, due to a
"mutation in the weather from extreme
"dryness to a moist state of the atmos-
"phere." The essential characteristics
here "various painful nauseating Sen-
"sations in the Stomach and a per-
"manent State of uneasy distension
"and irritation of the bowels." This
description seems more applicable to
Enteric Fever than Typhus. In 1786
an outbreak of new fever occurred;
the cause being a boy who had come
from Dublin, where the fever was then
raging. Thus year after year the
disease continues, at one time severe
at another less so. In 1790, it is
described thus "lassitude and languor
"with marked Sensibility to cold, pre-
"ceding painful affections of the Head
"and back, with intense heat, accompanied
"by universal and moderate tendency
"to perspiration. By these means the
"Crisis would occur at the 3rd or 4th day.
"In cases of imminent danger an insuperable

"wakeful propensity and inquietude pre-
"vailed, with stupor, delirium and various
"spasmodic affections; the disease for
"the most part fatally terminating at
"11 days, if longer protracted a state
"of malignant putrescence obtained,
"indicating a more tedious yet equally
"unpropitious event." This description
seems more applicable to Typhus, except
in the crisis occurring on the 3rd or 4th
day. In 1797, the fever was accom-
panied by "powerful and painful -
"determinations to the bowels" and "im-
"prudent exposure to cold, when ap-
"parently recovering, would often induce
"an active and permanent exacerbation
"of the disease." In this description,
Enteric fever seems more indicated
than Typhus, more especially when the
description of the relapses are taken into
consideration. The year following,
in 1798, the fever was similar with the
bowels powerfully affected. In 1801
"A nervous fever was introduced from the
"Isle of Man, distinguished by con-
"vulsive and putrefactive symptoms,
"with a crisis on the 14th to the 17th day,
"Hiccough and a convulsive tendency

"was the characteristic of this outbreak."
In 1802 "a purely dysenteric fever
"which had long prevailed in Liverpool
"was brought to Whitehaven" and in the
same year, "the moist state of the weather
"gave activity to a fever, which was
"accompanied by a putrid eruption
"and frantic delirium, in the early stages
"of the disease, with hiccough, convulsions
"and death on the 4th to the 11th day."

The report for the year 1818
gives a total of 2330 cases of "Typhus
Fever" since the opening of the institution,
but unfortunately does not give
the number of deaths. The only note
being that the greatest number of ad-
missions, were between the ages of 20
and 30, and the greatest number
of deaths between 30 and 40, and 40 and
50, both decades being equally fatal.
This does not agree with the experience
of later years, for the most cases oc-
curred between 10 and 20 years, and the
mortality increased very markedly every
decade. In the typhus fever described
in 1802, there is a "livid eruption", and
the disease comes to a crisis on the
14th day, generally with rapid improvement.

Coming now to a later date, from 1830 to 1849, and taking D. I. Anon's Statistics (See table I at end of paper) I find there were 613 cases with 89 deaths, which is equal to a death rate of 14.51 per cent. The male deaths were 49 in a total of 313 cases, giving a death rate of 15.80 per cent. while the females had 40 deaths in 303 cases equal to 13.20 per cent. The male deaths thus showing a much higher percentage than the female. On examining the ages it is seen that most cases occur between the ages of 20 and 30, the number being 230. The deaths at these ages were 27, equal to 11.73 per cent. This agrees with the 1818 reports which states that the most cases occurred between 20 & 30. The next commonest age of attack is between 10 and 20, with 205 cases and 18 deaths equal to 8.78 per cent.

Between 30 and 40 there were 102 cases and 17 deaths giving a death rate of 16.66 per cent. From 40 to 50 there were 45 cases and 13 deaths equal to 28.88 per cent. Between 50 and 60 there were 27 cases with 10 deaths, or 37.03 per cent.

While between 60 & 70 there were four cases all of which were fatal. The result of these figures is quite in keeping with all the statistics of Typhus Fever, namely the increase of fatality, with the increase of age, especially after 40.

From 1849 until the end of 1880. There were admitted into the Fever wards of the Infirmary no less than 1441 cases of Typhus Fever. The majority of these cases came from houses in the town, but it is noticeable that a considerable number of cases came from vessels in the harbour, especially from amongst the apprentices to the small coasting vessels that trade between this port and Ireland or the Isle of Man.

After 1880, the infirmary authorities closed the fever wards in that institution, as they were a source of danger to the other patients, and being situated in the midst of a closely populated part of the town, were in every way unsuitable for the proper and safe treatment of infectious diseases. Taking the thirty two years, from

1849 to 1880, as a basis, it will be seen that there were 723 males and 718 females. (A full table with the number of cases and deaths in each year is appended.) The total number of deaths was 235; this out of a total of 1441 cases equals a death rate of 16.30 per cent. The male death rate was 18.39 per cent, there being 133 deaths in the 723 cases, while the female death rate was only 14.42 per cent. or 102 deaths in 718 cases.

Out of all the 32 years tabulated, 4 years supply more than half the cases, namely, 1863 with 224 cases; 1865 with 100; 1869 with 204; and 1870 with 216; a total of 750, while the other 28 years supply the remainder.

On making an analysis of the ages, it will be seen from the table, (No 4) that there were 86 cases under 10 years, with five deaths, giving a death rate of 5.81 per hundred. Even at this early age there is a greater fatality amongst the males than the females, for the death rate of the former is 8.10 per cent, while the latter is only 4.08; little over one half. The age at which

the greatest number of cases occurred, was between 10 and 20. There being 476 in all; 215 were males and 261 females; the number of deaths was 35, giving a death rate of 7.30 per cent.

The difference in the mortality, in the sexes is very marked in this decade, the male rate being double that of the female; the former 10.23, the latter 5.

Between 20 and 30, there were 427 cases and 62 deaths or 14.52 per cent. In this decade the difference between the male and female death rate is not nearly so great, the male rate being 14.63; as compared to 14.30 in the female. It is also noticeable that the male cases at these ages are much more numerous than the females cases, being 246 to 181.

From 30 to 40 years, the number of male cases, is also greater than the female there being 108 to 93 of the latter. The death rate is 21.39 per cent. 23.14 for males, and 21.39 for females.

Between 40 and 50 there occurred 148 cases with 45 deaths, which gives a death rate of 30.40 per cent. the male death rate here is 10 per cent greater

than the female, 35.71 male to 25.64 female.

The percentage of deaths between 50 and 60 is not much higher than between 40 and 50; being 32.14 over all, or 31.03 for females and 33.33 for males.

There was a total of 56 cases and 18 deaths.

Over 60 years of age, the mortality increases very much, the death rate between 60 and 70 being 51.30 per hundred, the male rate is 62.15, and the female 43.00. After 70, eighty per cent of the cases died, and at this age the female mortality exceeded the male, the rates being for the males 45.00 per cent, and for the females 83.53.

To sum up, in taking the whole of the reported cases from 1830 till the end of the last outbreak in 1890, we have a total of 2162 cases, with 340 deaths, thus giving a death rate over all of 15.68 per cent.

Of these 2162 cases 1084 were males and 1078 females. There were 191 deaths among males, and 149 among females. The death rates were, Males 17.62. Females 13.84 per cent. a difference of nearly 4 per cent.

From these figures it will be seen that while males and females are pretty equally attacked with the disease, it is undoubtedly much more fatal to males than it is to females. This fact is distinctly shown in all the epidemics that have occurred. The fatality to males is greater at all ages, except between 20 and 30. when the mortality in both sexes is nearly equal.

After 70, the female death rate is greater than that of the males, but the limited number of cases, do not permit of much importance being attached to that.

It is a remarkable fact, that of all the cases collected, nearly three fourths of the total number, occur before the age of 30, and more than five sixths before forty, showing that the young are much more liable to take the disease.

But age does not give immunity from the disease, as is shown by the fact that ten cases occurred after 40. Children of very tender ages take the fever, and it seems more fatal

under one year than between that age and 5. Two children that I saw aged 5 months, and 8 months respectively both died. In both cases the mothers had the fever, so probably the want of natural nourishment assisted in the fatal result. In both cases the mothers recovered.

In some of the tables which are appended I have divided them into three columns to show the source from whence the figures are derived. The three sources:-

1. Dr. Sturges's figures as published in the Lancet for September 1848, from the year 1830 till 1848.
2. The number of cases taken from the Infirmary books from 1849 till 1880 inclusive.
3. The number of cases in the two outbreaks, previously described, 1884-1890.

Fever Statistics by J. F. J. Anson (Lancet 1848)

Year	Male	Female	Total	Male	Deaths		Total
					Male	Female	
1831	12	9	21	—	2	—	2
32	3	8	11	1	4	—	5
33	2	1	3	—	—	—	—
34	3	2	5	—	—	—	—
35	11	12	23	2	1	—	3
36	8	6	14	1	1	—	2
37	4	12	16	—	1	—	1
38	15	8	23	4	2	—	6
39	6	2	8	—	—	—	—
40	11	9	20	3	4	—	7
41	11	6	17	1	1	—	2
42	7	3	10	1	—	—	1
43	14	17	31	—	—	—	—
44	34	34	68	7	7	—	14
45	7	6	13	3	—	—	3
46	25	17	42	4	2	—	6
47	86	71	157	16	1	—	17
1848	51	80	131	6	14	—	20
	310	303	613	49	40	—	89

II Influence of age

Age	Total	Deaths		Total deaths	Death rate %
		Male	Female		
10 to 20	205	11	7	18	8.78
20 to 30	230	15	12	27	11.73
30 to 40	102	11	6	17	16.66
40 to 50	45	6	7	13	28.88
50 to 60	27	4	6	10	37.03
60 to 70	4	2	2	4	100.00

III. Typhus Fever cases 1849 till 1880.

Year	Total No of cases	Males		Females		Total Deaths
		Recovered	Died	Recovered	Died	
1849	46	24	5	13	4	9
50	22	13	2	6	1	3
51	20	7	1	11	1	2
52	23	9	2	11	1	3
53	20	11	—	9	—	—
54	12	6	3	3	—	3
55	11	10	—	1	—	—
56	25	9	3	10	3	6
57	13	10	—	3	—	—
58	4	2	—	2	—	—
59	8	4	1	3	—	1
60	5	4	—	—	1	1
61	9	9	—	—	—	—
62	62	28	8	25	1	9
63	227	89	15	108	15	30
64	62	24	4	32	2	6
65	100	37	5	47	11	16
66	49	25	6	16	2	8
67	32	10	2	18	2	4
68	18	9	1	7	1	2
69	207	92	16	86	13	29
70	216	64	24	106	22	46
71	50	22	5	16	7	12
72	7	5	—	1	1	1
73	60	30	6	19	5	11
74	30	10	3	14	3	6

III. Continued.

	Total	M. Rec ^d	M. Died	F. recov ^d	F. died	Total deaths
1845	4	3	1	—	4	1
46	4	2	—	2	1	—
47	34	6	5	22	1	6
48	36	10	9	13	4	13
49	15	3	3	8	1	4
1880	10	3	4	4	—	3
	1441	590	133	616	102	235

IV. Classified according to age.

		Recoveries	Total	Deaths	Total	Death rate per cent.
Under 10	M	34	81	3	5	5.81
	F	47		2		
10 to 20	M	193	441	22	35	7.39
	F	248		13		
20 to 30	M	210	365	36	62	14.52
	F	155		26		
30 to 40	M	83	158	25	43	21.39
	F	75		18		
40 to 50	M	45	103	25	45	30.40
	F	58		20		
50 to 60	M	18	38	9	18	32.14
	F	20		9		
60 to 70	M	6	18	10	19	51.35
	F	12		9		
70 & upward	M	1	2	3	8	80.00
	F	1		5		
	Recoveries	1206		Deaths	235	

V Death rate at different ages, and sexes.

Under 10	M	3 deaths in 37 cases =	8.10%.	5.81%
	F	2 " " 49 " =	4.08	
	Total	5 " " 86 " =		
10 to 20	M	22 " " 215 " =	10.23	7.3
	F	13 " " 261 " =	5.00	
	Total	35 " " 476 " =		
20 to 30	M	36 " " 246 " =	14.63	14.52
	F	26 " " 181 " =	14.30	
	Total	62 " " 427 " =		
30 to 40	M	25 " " 108 " =	23.14	21.39
	F	18 " " 93 " =	19.35	
	Total	43 " " 201 " =		
40 to 50	M	25 " " 70 " =	35.71	30.40
	F	20 " " 78 " =	25.64	
	Total	45 " " 148 " =		
50 to 60	M	9 " " 27 " =	33.33	32.14
	F	9 " " 29 " =	31.03	
	Total	18 " " 56 " =		
60 to 70	M	10 " " 16 " =	62.15	51.35
	F	9 " " 27 " =	43.00	
	Total	19 " " 37 " =		
70 and upward	M	3 " " 4 " =	75.00	80.00
	F	5 " " 6 " =	83.63	
	Total	8 " " 10 " =		
Totals	M	133 " " 723 " =	18.39%	
	F	102 " " 718 " =	14.42%	
	Total	235 " " 1441 " =	16.30%	

VI. Total number of cases from 3 Sources

	<i>S. Anson</i>	1849-1880	1884-1890	<i>Totals</i>
<i>Males</i>	310	723	51	1084
<i>Females</i>	303	718	57	1078
<i>Totals</i>	613	1441	108	2162

VII Total cases classified according to age.

	<i>S. Anson</i>	1849-1880	1884-1890	<i>Totals</i>
<i>Under 10</i>	—	86	19	105
<i>10 to 20</i>	205	476	37	718
<i>20 to 30</i>	230	427	22	679
<i>30 to 40</i>	102	201	19	322
<i>40 to 50</i>	45	148	9	202
<i>50 to 60</i>	27	56	—	83
<i>60 to 70</i>	4	37	2	43
<i>70 and upw^d</i>	—	10	—	10
<i>Totals</i>	613	1441	108	2162

VIII Deaths at all ages.

	<i>S. Anson</i>	1849-1880	1884-1890	<i>Totals</i>
<i>Males</i>	49	133	9	191
<i>Females</i>	40	102	7	149
<i>Totals</i>	89	235	16	340

IX. Percentage of Deaths at all ages.

	<i>S. Anson</i>	1849-1880	1884-1890	<i>General</i>
<i>Males</i>	15.80	18.39	17.64	17.62
<i>Females</i>	13.20	14.42	12.28	13.82
<i>General</i>	14.51	16.30	14.81	15.68

X Deaths at various ages.

	J. Anson	1849-1880	1884-1890	Totals
Under 10	—	5	0	5
10 to 20	18	35	3	56
20 to 30	27	62	4	93
30 to 40	17	43	4	64
40 to 50	13	45	4	62
50 to 60	10	18	—	28
60 to 70	4	19	1	24
70 and up?	—	8	—	8
Totals	89	235	16	340

XI Death rate per cent at various ages.

	J. Anson	1848-1880	1884-1890	General
Under 10	—	5.81	0.00	4.76
10 to 20	8.78	7.39	8.11	7.80
20 to 30	11.73	14.52	18.18	12.22
30 to 40	16.66	21.39	21.05	19.87
40 to 50	28.88	30.40	44.44	30.69
50 to 60	37.03	32.14	—	33.73
60 to 70	100.00	51.35	50.00	55.81
70 & upwards	—	80.00	—	80.00
General	14.51	16.30	14.81	15.68